

Glossary

Absorption

The movement of dissolved substances (e.g., pollution) into cells by diffusion.

Adsorption

The adhesion of dissolved substances to the surface of sediment or on the surface of an organism (e.g., a flatfish).

Anthropogenic

Made and introduced into the environment by humans, especially pertaining to pollutants.

Assemblage

An association of interacting populations in a given habitat (e.g., an assemblage of benthic invertebrates on the ocean floor).

Before-After-Control-Impact-Paired (BACIP) analysis

An analytical tool used to assess environmental changes caused by the effects of pollution. A statistical test is applied to data from matching pairs of control and impacted sites before and after an event (i.e., initiation of wastewater discharge) to test for significant change. Significant differences are generally interpreted as being the result of the environmental change attributed to the event. Variation that is not significant reflects natural variation.

Benthic zone

Pertaining to the ecological zone inhabited by organisms living on or in the ocean bottom.

Benthos

Living organisms (e.g., algae and animals) associated with the sea bottom.

Bioaccumulation

The process by which a chemical becomes accumulated in tissue over time through direct intake of contaminated water, the consumption of contaminated prey, or absorption through the skin or gills.

Biota

The living organisms within a habitat or region.

Biochemical Oxygen Demand (BOD)

BOD is the amount of oxygen consumed (through biological or biochemical processes) during the decomposition of organic material contained in a water or sediment sample. It is a measure for certain types of organic pollution, such that high BOD levels suggest elevated levels of organic pollution.

Benthic Response Index (BRI)

The BRI measures levels of environmental disturbance by assessing the condition of a benthic assemblage. The index was based on historic distributions of organisms found in the soft sediments of the Southern California Bight.

Colony-Forming Unit (CFU)

The CFU is the bacterial cell or group of cells which reproduce on a plate and result in a visible colony that can be quantified as a measurement of density; it is often used to estimate bacteria concentrations in ocean water.

Control site

A geographic location that is far enough from a known pollution source (e.g., ocean outfall) to be considered representative of an undisturbed environment. Data collected from control sites are used as a reference and compared to impacted sites.

California Ocean Plan (Ocean Plan)

The COP is California's ocean water quality control plan. It limits wastewater discharge and implements ocean monitoring. Federal law requires the plan to be reviewed every three years.

Crustacea

A group (subphylum) of marine invertebrates characterized by jointed legs and an exoskeleton (e.g., crabs, shrimp, and lobsters).

Conductivity, Temperature, Depth (CTD)

A profiling instrument that when deployed continually measures a variety of physical and chemical parameters throughout the water column, all as a function of depth.

Demersal

Organisms living on or near the bottom of the ocean and capable of active swimming.

Dendrogram

A tree-like diagram used to represent hierarchical relationships from a multivariate analysis where results from several monitoring parameters are compared among sites.

Detritus

Particles of organic material originating from decomposing organisms. Used as an important source of nutrients in a food web.

Diversity

A measurement of community structure which describes the abundances of different species within a community, taking into account their relative rarity or commonness.

Dominance

A measurement of community structure that describes the minimum number of species accounting for 75% of the abundance in each grab.

Echinodermata

A taxonomic phylum of marine invertebrates characterized by the presence of spines, a radially symmetrical body, and tube feet (e.g., sea stars, sea urchins, and sea cucumbers).

Effluent

Wastewater that flows out of a sewer, treatment plant outfall, or other point source and is discharged into a water body (e.g., ocean, river).

Epifauna

Animals living upon the surface of marine sediments.

Fecal Indicator Bacteria (FIB)

FIB are the bacteria (total coliform, fecal coliform, and enterococcus) measured and evaluated to provide information about the movement and dispersion of wastewater discharged to the Pacific Ocean through the outfall.

Halocline

A vertical zone of water in which the salinity changes rapidly with depth.

Impact site

A geographic location that has been altered by the effects of a pollution source, such as a wastewater outfall.

Indicator species

Marine invertebrates whose presence in the community reflects the state of the environment. The loss of pollution-sensitive species or the introduction of pollution-tolerant species can indicate anthropogenic impact.

Infauna

Animals living in the soft bottom sediments, usually burrowing or building tubes within.

Invertebrate

An animal without a backbone (e.g., sea star, crab, or worm).

Macrobenthic invertebrate

Epifaunal or infaunal benthic invertebrates that are visible with the naked eye. This group typically includes those animals larger than meiofauna and smaller than megafauna. These animals are collected in grab samples from soft-bottom marine habitats and retained on a 1-mm mesh screen.

Method Detection Limit (MDL)

Defined by the USEPA as “the minimum concentration that can be determined with 99% confidence that the true concentration is greater than zero.”

Megabenthic invertebrate

A larger, usually epibenthic and often motile,

bottom-dwelling animal such as a sea urchin, crab, or snail. These animals are typically collected by otter trawl nets with a minimum mesh size of 1 cm.

Mollusca

A taxonomic phylum of invertebrates characterized as having a muscular foot, visceral mass, and a shell. Examples include snails, clams, and octopuses.

Motile

Self-propelled or actively moving.

Niskin bottle

A device used to collect discrete water samples that is composed of a long plastic tube that allows seawater to pass through until the caps at both ends are triggered to close from the surface. They often are arrayed with several others in a rosette sampler to collect water at various depths.

Non-point source

Pollution sources from numerous points, not a specific outlet.

National Pollutant Discharge Elimination System (NPDES)

The NPDES is a federal permit program that controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

Ophiuroidea

A taxonomic class of echinoderms that comprises brittle stars. Brittle stars usually have five long, flexible arms and a central disk-shaped body.

Polycyclic Aromatic Hydrocarbons (PAHs)

The USGS defines PAHs as, “hydrocarbon compounds with multiple benzene rings. PAHs are typical components of asphalts, fuels, oils, and greases.”

Polychlorinated Biphenyls (PCBs)

The USEPA defines PCBs as, “a category, or family, of chemical compounds formed by the addition of chlorine (C_{12}) to biphenyl ($C_{12}H_{10}$), which is a dual-ring structure comprising two 6-carbon benzene rings linked by a single carbon-carbon bond.”

PCB congener

The USEPA defines a PCB congener as “one of the 209 different PCB compounds. A congener may have between one and 10 chlorine atoms, which may be located at various positions on the PCB molecule.”

Phi

The conventional unit of sediment size based on the log of sediment grain diameter. The larger the phi number, the smaller the grain size.

Plankton

Minute animal and plant-like organisms that are that are passively carried by ocean currents.

Point Loma Ocean Outfall (PLOO)

The PLOO is the 7.2 km (4.5 mi) underwater pipe that originates at the Point Loma Wastewater Treatment Plant and discharges treated wastewater at a depth of 96 m (320 ft).

Point source

Pollution discharged from a single source (e.g., municipal wastewater treatment plant, storm drain) to a specific location through a pipe or outfall.

Polychaeta

A taxonomic class of invertebrates characterized as having worm-like features, segments, and bristles or tiny hairs. Examples include bristle worms and tube worms.

Pycnocline

A zone in the ocean where sea water density changes rapidly with depth.

Recruitment

The retention (passive or self-recruiting) of larvae and juveniles into the adult population in an open ocean environment.

Relict sand

Coarse reddish-brown sand that is a remnant of a pre-existing formation after other parts have disappeared. Typically originating from land and transported to the ocean bottom through erosional processes.

Rosette sampler

A device consisting of a round metal frame housing a CTD in the center and multiple Niskin bottles arrayed about the perimeter. As the instrument is lowered through the water column, continuous measurements of various physical and chemical parameters are recorded by the CTD. Discrete water samples are captured at desired depths by the bottles.

South Bay Ocean Outfall (SBOO)

The SBOO is the underwater pipe originating at the International Wastewater Treatment Plant and used to discharge treated wastewater. It extends 5.6 km (3.5 miles) offshore and discharges into about 27 m (90 ft) of water.

South Bay Water Reclamation Plant (SBWRP)

The SBWRP provides local wastewater treatment services and reclaimed water to the South Bay. The plant began operation in 2002 and has a wastewater treatment capacity of 15 million gallons a day.

Southern California Bight (SCB)

The SCB is the geographic region that stretches from Point Conception, USA to Cabo Colnett, Mexico and encompasses nearly 80,000 km² of coastal land and sea.

Shell hash

Sediments composed of a large fraction of shell fragments.

Skewness

A measure of the lack of symmetry in a distribution or data set. Skewness can indicate where most of the data lies within a distribution. It can be used to describe the distribution of particle sizes within sediment grain size samples.

Sorting

The range of grain sizes that composes marine sediments. Also refers to the process by which sediments of similar size are naturally segregated during transport and deposition according to the velocity and transporting medium. Well sorted sediments are of similar size (such as desert sand), while poorly sorted sediments have a wide range of grain sizes (as in a glacial till).

Species richness

The number of species per sample or unit area. A metric used to evaluate the health of macrobenthic communities.

Standard length

The measurement of a fish from the most forward tip of the body to the base of the tail (excluding the tail fin rays). Fin rays can sometimes be eroded by pollution or preservation so measurement that includes them (i.e., total length) is considered less reliable.

Thermocline

A thermally stratified zone of water that separates warmer surface water from colder deep water and within which temperature changes rapidly over a short depth.

Tissue burden

The total concentration of measured chemicals that is present in a tissue (e.g., fish muscle).

Transmissivity

A measure of water clarity based upon the ability of water to transmit light along a straight path. Light that is scattered or absorbed by particulates (e.g., plankton, suspended solid materials) decreases the transmissivity (or clarity) of the water.

Upwelling

The movement of nutrient-rich and typically cold water from the depths of the ocean to the surface waters.

Van Dorn bottle

Another form of water collection device, similar to a Niskin bottle, that is composed of a long plastic tube that allows seawater to pass through until the caps at both ends are triggered to close from the surface. They are often used in an array with several others along a suspended line in the water column.

Van Veen grab

A mechanical device designed to collect ocean sediment samples. The device consists of a pair of

hinged jaws and a release mechanism that allows the opened jaws to close and entrap a 0.1 m² sediment sample once the grab touches bottom.

Wastewater

A mixture of water and waste materials originating from homes, businesses, industries, and sewage treatment plants.

Zone of Initial Dilution (ZID)

This is the region of initial mixing of the surrounding receiving waters with wastewater from the diffuser ports of an outfall. The area includes the underlying seabed. In the ZID, the environment may be chronically exposed to pollutants and often is the most impacted part of an ecosystem.

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